

**UNITED STATES DISTRICT COURT
DISTRICT OF MASSACHUSETTS**

SINGULAR COMPUTING LLC,

Plaintiff,

v.

GOOGLE LLC,

Defendant.

**Civil Action No.
19-12551-FDS**

**MEMORANDUM AND ORDER ON PLAINTIFF’S MOTION FOR PARTIAL
SUMMARY JUDGMENT OF VALIDITY BASED ON *INTER PARTES* REVIEW
ESTOPPEL UNDER 35 U.S.C. § 315(e)(2)**

SAYLOR, C.J.

This is an action for patent infringement. Plaintiff Singular Computing LLC holds U.S. Patent Nos. 8,407,273 (“the ’273 Patent”), 9,218,156 (“the ’156 Patent”), and 10,416,961 (“the ’961 Patent”), which each describe a method of “Processing with Compact Arithmetic Processing Element[s].” Singular has sued defendant Google LLC for infringing those patents.¹

Google previously sought *inter partes* review of the patents, alleging that the asserted claims were obvious over various combinations of patents and prior publications. The Patent Trial and Appeal Board granted review and upheld the validity of certain claims asserted here.

Singular has moved for partial summary judgment of validity based on statutory estoppel under 35 U.S.C. § 315(e)(2). In substance, it seeks to prevent Google from raising invalidity defenses based on prior art it raised or reasonably could have raised during the IPR proceeding.

¹ Singular has submitted to Google a draft covenant not to sue for infringement of the ’961 patent. (Pl. Mem. at 2). Therefore, the Court will limit its analysis to the ’273 and ’156 patents.

For the following reasons, the motion for partial summary judgment of validity will be denied. While Google will be estopped from raising invalidity defenses based (even in part) on printed publications and patents it raised or reasonably could have raised in the IPR proceeding, it will be permitted to raise invalidity defenses based on other evidence (such as lay and expert testimony) of prior-art systems.

I. Background

A. Factual Background

The following facts appear to be undisputed.

1. Parties

Singular Computing LLC is a Delaware limited liability company that develops novel computer architectures. (Am. Compl. ¶¶ 1, 6).² It owns several patents directed at processors that are “designed to perform low precision and high dynamic range (LPHDR) arithmetic operations.” (*Id.* ¶ 9). It is based in Newton and Cambridge, Massachusetts. (*Id.* ¶ 1).

Google LLC is a Delaware limited liability company. (*Id.* ¶ 2). Among other things, it provides consumers with a variety of computer-based services such as Google Search, Google Translate, Google Photos, Google Assistant, and Gmail. (*See id.* ¶ 15). The amended complaint alleges that Google has built and operates several infringing processing units at its own data centers. (*Id.* ¶¶ 16-26, 81-132).

2. Underlying Technology

The patents at issue in this case generally relate to computer processors.

According to the patents, conventional central processing units (“CPUs”) perform

² The Court has previously reviewed the facts and technology at the heart of this case in its Memorandum and Order on Defendant’s Motion to Dismiss. (ECF No. 51). Facts relevant to the current motion are recapitulated here.

arithmetical operations, such as addition, subtraction, multiplication, and division, with “great precision,” which typically requires “on the order of a million transistors.” (’273 patent col. 3 ll. 7-22). Although such CPUs “make inefficient use of their transistors,” this high-precision architecture remains the norm because “[m]any applications need this kind of precision” and it preserves “software compatibility with earlier designs.” (*Id.*; *see also id.* col. 5 ll. 41-62).

Because of the inefficiency of conventional CPU designs, “other kinds of computers have been developed to attain higher performance.” (*Id.* col. 3 ll. 31-32). The patent describes a variety of such architectures, including single instruction stream/multiple data stream designs, field programmable gate arrays, and graphics processing units (“GPUs”). (*See generally id.* col. 3 l. 30-col. 5 l. 62). The patent claims that while many of those architectures use lower-precision arithmetic and may have advantages for specialized applications, they suffer from a variety of flaws that either prevent their use for modern general-purpose computing or render them approximately as inefficient as conventional CPU designs. (*See generally id.*).

3. Patents at Issue

The ’273 patent issued on March 26, 2013. (Compl. ¶ 27). The ’273 Patent purports to take a “fundamentally different approach” from prior architectures by incorporating “processing elements designed to perform arithmetic operations . . . on numerical values of low precision but high dynamic range” into computer processors or other devices. (’273 patent col. 2 ll. 11-18; col. 5 l. 63). Those LPHDR processing elements “produce results that frequently differ from exact results” by a margin of error, but “they are capable of operating on inputs and/or producing outputs spanning a range” of numbers that is relatively large. (*See id.* col. 2 ll. 28-39).

According to the patent, each individual LPHDR processing element is “relatively small,” which enables them to be deployed together in “massively parallel” configurations. (*Id.* col. 6 ll. 51-55). And the patent claims that while persons of ordinary skill in the art commonly

believe that such “massive amounts of LPHDR computation” are of little use, they in fact “provide significant practical benefits in at least several significant applications.” (*Id.* col. 6 l. 51-col. 7 l. 11). For example, it claims that processors with multiple LPHDR processing elements can efficiently solve a task known as the “nearest neighbor problem,” which has applications in compressing or comparing various types of data. (*Id.* col. 17 l. 29-col. 21 l. 32).

The ’156 and ’961 Patents are continuations of the ’273 Patent and issued on December 22, 2015, and September 17, 2019, respectively. (Amend. Compl. ¶ 27). They are also entitled “Processing with Compact Arithmetic Processing Element,” and share a specification with the ’273 Patent.

B. Procedural Background

On December 20, 2019, Singular filed this action. It filed an amended complaint on March 20, 2020. The complaint alleges three counts against Google: infringement of the ’273 Patent (Count 1); infringement of the ’156 Patent (Count 2); and infringement of the ’961 Patent (Count 3).

On April 17, 2020, Google moved to dismiss the amended complaint under Fed. R. Civ. P. 12(b)(6), contending that the patents-in-suit claim fundamental and abstract ideas that are not patentable under 35 U.S.C. § 101. The court denied that motion on June 25, 2020.

Google then filed an amended answer on July 23, 2020, asserting invalidity and non-patentability under 35 U.S.C. §§ 101-103, and 112 as an affirmative defense, among others.

Between October 30 and November 6, 2020, Google filed six requests for *inter partes* review (“IPR”) with the Patent Trial and Appeal Board (“PTAB”). In its petitions, Google alleged that claims 1-26, 28, 32-61, 63, 67-70 of the ’273 patent; claims 1-8, 16, and 33 of the ’156 patent; and claims 1-5, 10, 13-14, 21, and 23-25 of the ’961 patent were invalid for obviousness under 35 U.S.C. § 103. (Gannon Decl. Exs. D, E, F). Google also cited additional

prior art references for background purposes. (Gannon Decl. Ex. G).

On November 6, 2020, Google served its responsive contentions concerning non-infringement and invalidity with attached claim charts. (Gannon Decl. Ex. H). These claim charts identified CNAPS, VFLOAT, and GRAPE-3 as prior art “systems” that disclosed the asserted claim limitations, among other systems. (Gannon Decl. Exs. K, R, W).

On May 11, 2022, PTAB issued Final Written Decisions (“FWDs”) in the instituted IPRs, finding as follows:

Patent No. and IPR No.	Claims Upheld	Claims Found Invalid
'961, IPR2021-00155	3, 23	1-2; 4-5; 10; 13-14; 21; 24-25
'156, IPR2021-00165	3-8	1-2; 16; 33
'273, IPR2021-00179	3-20; 25; 34-61; 63; 67-70	1-2; 21-24; 26; 28; 32-33

(Gannon Decl., Exs. A-C). The claims upheld include the two asserted in this suit: Claim 7 of the '156 patent and Claim 53 of the '273 patent.

On November 3, 2022, Singular moved for partial summary judgment of validity based on *inter partes* review estoppel under 35 U.S.C. § 315(e)(2).

II. Standard of Review

A. Summary Judgment Standard

The role of summary judgment is to “pierce the pleadings and to assess the proof in order to see whether there is a genuine need for trial.” *Mesnick v. Gen. Elec. Co.*, 950 F.2d 816, 822 (1st Cir. 1991) (internal quotation marks omitted). Summary judgment is appropriate when the moving party shows that “there is no genuine dispute as to any material fact and the movant is entitled to judgment as a matter of law.” Fed. R. Civ. P. 56(a). “Essentially, Rule 56[] mandates the entry of summary judgment ‘against a party who fails to make a showing sufficient to

establish the existence of an element essential to that party's case, and on which that party will bear the burden of proof at trial.'" *Coll v. PB Diagnostic Sys., Inc.*, 50 F.3d 1115, 1121 (1st Cir. 1995) (quoting *Celotex Corp. v. Catrett*, 477 U.S. 317, 322 (1986)). In making that determination, the court must "view the record in the light most favorable to the nonmovant, drawing reasonable inferences in his favor." *Noonan v. Staples, Inc.*, 556 F.3d 20, 25 (1st Cir. 2009). When "a properly supported motion for summary judgment is made, the adverse party must set forth specific facts showing that there is a genuine issue for trial." *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 250 (1986) (internal quotation marks and footnotes omitted). The non-moving party may not simply "rest upon mere allegation or denials of his pleading," but instead must "present affirmative evidence." *Id.* at 256-57.

III. Analysis

A. Inter Partes Review Estoppel

The Leahy-Smith America Invents Act ("AIA"), Pub. L. No. 112-29, 125 Stat. 284 (2011), created the *inter partes* review process to allow an accused infringer to request that the PTAB review the validity of contested patent claims. 35 U.S.C. § 311(a). Section 311(b) sets out two limitations on the type of invalidity claim a petitioner may raise in an IPR petition: the request may be made "only on a ground that could be raised under section 102 or 103 and only on the basis of prior art consisting of patents or printed publications." 35 U.S.C. § 311(b). Section 102 covers defenses based on anticipation, while Section 103 covers defenses based on obviousness. In short, a petitioner in an IPR proceeding may seek a determination that a patent is invalid (1) only on the ground of anticipation or obviousness and (2) only on the basis of prior art in the form of patents or printed publications.

Congress included an estoppel provision in the AIA to avoid duplicative and abusive validity challenges before the PTAB and the district courts. *See Intuitive Surgical, Inc. v.*

Ethicon LLC, 25 F.4th 1035, 1043 (Fed. Cir. 2022) (citing 157 CONG. REC. S936, S952 (daily ed. Feb. 28, 2011)). Under that provision, a petitioner who receives a FWD in an IPR proceeding is estopped from subsequently asserting in a district court proceeding “that the claim is invalid on any ground that the petitioner raised or reasonably could have raised during that *inter partes* review.” 35 U.S.C. § 315(e)(2); *see also California Inst. of Tech. v. Broadcom Ltd.*, 25 F.4th 976, 991 (Fed. Cir. 2022) (“[E]stoppel applies not just to claims and grounds asserted in the petition and instituted for consideration by the Board, but to all grounds not stated in the petition but which reasonably could have been asserted against the claims included in the petition.”). Reliance in the district court on a patent or printed publication reference that was not raised in the IPR proceeding may be barred by statutory estoppel if (1) the IPR petitioner actually knew of the reference or (2) a skilled searcher conducting a diligent search reasonably could have been expected to discover the reference. *See Palomar Techs., Inc. v. MRSI Sys., LLC*, 2020 WL 2115625, at *3 (D. Mass. May 4, 2020). The party seeking to invoke statutory IPR estoppel has the initial burden of showing that it applies. *SiOnyx, LLC v. Hamamatsu Photonics K.K.*, 330 F. Supp. 3d 574, 602-03 (D. Mass. 2018).

B. Prior-Art Systems

A petitioner in an IPR proceeding cannot challenge the validity of a patent based on prior-art products or systems. *Medline Indus., Inc. v. C.R. Bard, Inc.*, 2020 WL 5512132, at *3 (N.D. Ill. Sept. 14, 2020).³ “However, patents or printed publications that relate to and describe a physical product can, like other patents and printed publications, be raised in an IPR.” *Wasica Fin. GmbH v. Schrader Int’l, Inc.*, 432 F. Supp. 3d 448, 453 (D. Del. 2020). Whether and how

³ Courts tend to use the terms “product,” “device,” and “system” somewhat interchangeably. Google uses the term “system” here to refer to a “computer,” “chipset” or “code library.” For the sake of simplicity, this memorandum will generally use the term “system.”

§ 315(e)(2) applies to products and systems that are related to printed publications or patents that could have been raised at IPR is a question that has not been definitively resolved. *See id.* at 454 & n.6 (noting division among district courts).

Singular contends that Google should be estopped from asserting any system-based invalidity arguments that are “cumulative”—that is, duplicative—of printed publications or patents that it could have presented at IPR. (Pl. Mem. at 6-8); *see Wasica*, 432 F. Supp. 3d at 453-54. It cites to cases in which courts have found that a party is estopped from relying on system-or-device prior art where the physical product or non-public documents describing the product are not “the *only* available material that cites certain limitations.” *Avanos Medical Sales, LLC v. Medtronic Sofamor Danek USA, Inc.*, 2021 WL 8693677, at *2 (W.D. Tenn. Oct. 8, 2021) (emphasis added); *Wasica*, 432 F. Supp. 3d at 453-55. According to Singular, allowing Google to introduce system-based prior art when it could have submitted printed publications describing that art during the IPR proceeding “would give it a second bite at the apple and allow it to reap the benefits of the IPR without the downside of meaningful estoppel.” *Parallel Networks Licensing, LLC v. International Bus. Machines Corp.*, 2017 WL 1045912, at *12 (D. Del. Feb. 22, 2017), *aff’d*, 721 F. App’x 994 (Fed. Cir. 2018).

Singular’s proposed test is not grounded in the statutory text. The Patent Act says nothing about estopping invalidity claims that are “cumulative” or “duplicative” of those raised in an IPR proceeding. Nor does it specify that evidence outside of patents or publications is permissible only when that evidence provides the *sole* support for a claim limitation. *See Chemours Co. v. Daikin Indus., Ltd.*, 2022 WL 2643517, at *2 (D. Del. July 8, 2022) (“Congress could have dictated that estoppel applies to products covered by the paper art underlying the IPR where the paper art discloses the same claim limitations as the product. But Congress did not do

so.”); *Medline*, 2020 WL 5512132, at *4 (same). While the court is mindful of the risk that parties may raise a system invalidity theory as “a patent or printed publication theory in disguise,” the statute does not require that a court bar all system-based prior art simply because a party had access to a printed publication describing that system at the time of the IPR proceeding. *SPEX Techs. Inc v. Kingston Tech. Corp.*, 2020 WL 4342254, at *15 (C.D. Cal. June 16, 2020).

Google’s interpretation of the statute is likewise problematic. It asserts that estoppel does not apply where a party seeks to combine *any* evidence that it could not have presented at the IPR proceeding with *any* printed publications or patents. Indeed, it contends that estoppel would not apply even if it were to rely *only* upon printed publications, as long as those publications describe a product or system. According to Google, the estoppel bar applies to a single “ground” of invalidity, which it defines as a claim under § 102 that an invention is not novel if “patented or described in a printed publication.” (Def. Opp’n at 2).⁴ It asserts that any other asserted basis for invalidity—including that a claim was “known or used by others in this country,” “in public use,” and/or invented “by another,” which it characterizes as “system-based prior art invalidity” grounds—is not estopped, regardless of the type of evidence upon which it relies. (*Id.* at 4 (citing 35 U.S.C. §§ 102(a), (b), (g)(1) (2002))).

Google’s argument is not supported by the language of the statute. Section 311(b) specifies that a petition for IPR may be based on *either* § 102 or § 103. But under Google’s interpretation, estoppel would not apply to any invalidity arguments based on any other provision

⁴ Google’s invalidity contentions are based on the pre-AIA version of § 102. The America Invents Act amendments apply only to registrations filed eighteen months after the enactment date of September 16, 2011. AIA § 3, 125 Stat. at 293. Because the ’273 patent was filed on February 17, 2012, and because the ’156 patent is a continuation of the ’273 patent, the pre-AIA versions of §§ 102 and 103 apply to the patents at issue here. However, the provisions of the statutes upon which Google relies do not appear to be substantively different between the two versions.

of § 102 or obviousness under § 103. Furthermore, neither § 102 nor § 103 refer to “system prior art” as an independent “ground” for invalidity. To allow a party to present the same evidence styled as a different “theory” of invalidity would permit a party challenging a patent to make a complete end-run around the estoppel bar. *But see In re Koninklijke Philips Pat. Litig.*, 2020 WL 7392868, at *27 (N.D. Cal. Apr. 13, 2020) (finding “product prior art” to be a separate invalidity “ground” proved by showing the invention was in public use or on sale, as opposed to described in a patent or publication). Indeed, under Google’s view, even a prior-art patent that describes a system would never be subject to the estoppel bar, on the ground that the actual system itself could not be submitted in the IPR proceeding. That cannot be correct. Such a result would, among other things, substantially undermine the purpose of the estoppel bar and of IPR generally, which is “to establish a more efficient and streamlined patent system that will improve patent quality and limit unnecessary and counterproductive litigation costs.” *Milwaukee Elec. Tool Corp. v. Snap-On Inc.*, 2017 WL 4570787, at *5 (E.D. Wis. Oct. 12, 2017) (quoting Changes to Implement *Inter Partes* Review Proceedings, Post-Grant Review Proceedings, and Transitional Program for Covered Business Method Patents, 77 Fed. Reg. 48680-01 (Aug. 12, 2012) (codified at 37 C.F.R. §§ 42.100 et seq.)).

The more reasonable reading of the term “ground” as used in § 315(e)(2)—that is, “any ground that the petitioner raised or reasonably could have raised” in the IPR—is that it refers to any anticipation or obviousness claim based on prior art in the form of a patent or printed publication. That reading is more faithful to the statutory text, which uses the term “ground” in § 311(b) to refer to an anticipation or obviousness claim, not a particular piece of evidence. *See* 35 U.S.C. § 312(a)(3) (stating that a petition for IPR must identify “the *grounds* on which the challenge to each claim is based, and the *evidence* that supports the grounds for the challenge to

each claim” (emphasis added)); *Wasica*, 432 F. Supp. 3d at 454; *but see Medline*, 2020 WL 5512132, at *4 (defining ground “to mean the specific piece of prior art or combination of prior art that a petitioner raised, or could have raised, to challenge the validity of a patent claim during an IPR”). It is also more faithful to the purpose of the estoppel bar, which is to avoid duplicative litigation. It follows that a party is estopped from raising any invalidity theory under § 102 or § 103 based on “patents and publications” that were actually submitted in the IPR proceeding, or that reasonably could have been submitted. That is true whether the patent or publication at issue describes, explains, or refers to a system or device, and whether the patent or publication is relied on in the subsequent litigation in whole or only in part. And that is true even if the defendant could not have presented evidence of the actual system or device in the IPR proceeding.

Again, that result is most consistent with the statutory language and purpose, and the least likely to result in unfairness or abuse. The estoppel bar will not, however, apply to other forms of evidence concerning the existence of such a system or device, or how it anticipates the claims in the patent or renders them obvious.

In sum, an accused infringer who receives a final written decision in an IPR proceeding may challenge the validity of a patent in an infringement action in district court based on anticipation or obviousness, but only to the extent that the challenge is based on prior-art evidence that it could not have presented in a petition for IPR. A defendant is estopped from relying—even in part—on publications or patents that it knew of, or could have reasonably discovered, at the time of filing, even if those materials describe, explain, or refer to a system or product.

C. Application to Prior Art at Issue

In substance, there are three categories of prior art at issue: (1) patents and publications

that Google actually raised in the IPR proceeding; (2) patents and publications that Google did not raise, but was aware of, at the time of that proceeding; and (3) patents and publications concerning system prior art. Each category will be addressed in turn.

1. Prior Art Cited by Defendant in IPR Proceedings

Singular first alleges that Google should be estopped from asserting invalidity based on patents and printed publications that it explicitly cited to and relied on during the IPR proceeding. Google's IPR petitions alleged that various claims of the '156 and '273 patents were obvious over combinations of Dockser,⁵ Tong,⁶ and MacMillan.⁷ (Gannon Decl. Exs. E, F). It also cited additional patents and prior-art references for background purposes. (Gannon Decl. Ex. G).

References that Google explicitly cited to in the IPR proceedings clearly fall within the estoppel bar of § 315(e)(2), and Google does not appear to contend otherwise. Accordingly, Google will be estopped from alleging invalidity based on any of the patent or printed publication references included within its IPR petitions.

2. Prior Art Known to Google When It Filed for IPR

Singular next contends that Google should be estopped from asserting invalidity based on patents and printed publications not explicitly raised during IPR, but known to it at the time of filing its petitions. According to Singular, those references include the various items of patent and printed publication prior art that Google included in the invalidity contentions and claim

⁵ U.S. Patent Appl. Publ. No. 2007/0203967.

⁶ TONG ET AL., REDUCING POWER BY OPTIMIZING THE NECESSARY PRECISION/RANGE OF FLOATING-POINT ARITHMETIC, IEEE TRANSACTIONS ON VERY LARGE SCALE INTEGRATION (VLSI) SYSTEMS, Vol. 8, No. 3 (June 2000).

⁷ U.S. Patent No. 5,689,677.

charts served on Singular on November 6, 2020.

“[E]stoppel applies not just to claims and grounds asserted in the petition . . . but to all grounds . . . which reasonably could have been asserted against the claims included in the petition,” including grounds that the petitioner knew of at the time of filing. *Broadcom Ltd.*, 25 F.4th at 991. Google does not deny that it was aware of the patents and printed publications disclosed in its responsive contentions at the time of filing the petition for IPR. (Def. Response to Pl. SOF No. 20). Nor does it appear to oppose Singular’s motion with respect to these references. *See IOENGINE, LLC v. PayPal Holdings, Inc.*, 607 F. Supp. 3d 464, 510-11 (D. Del. 2022) (applying IPR estoppel to prior art disclosed in invalidity contentions); *Snyders Heart Valve LLC v. St. Jude Med.*, 2020 WL 1445835, at *8 (D. Minn. Mar. 25, 2020) (same).

Accordingly, Google will be estopped from asserting invalidity based on the printed publication and patent references identified in its invalidity contentions and claim charts served on November 6, 2020.

3. System Prior Art

Finally, Google asserts that it intends to rely on a variety of evidence of prior-art systems (alone and in combination with printed publications) in support of its invalidity arguments. It identifies three such systems—VFLOAT, CNAPS, and GRAPE-3—that it will argue show that the claimed inventions were either “known or used by others in this country,” “in public use,” or invented “by another.” (Def. Opp’n at 1 (citing 35 U.S.C. §§ 102(a), (b), (g)(2) (2002))).

In its responsive contentions and claim charts in this lawsuit, Google cited to prior-art publications describing the three systems and explaining how the systems anticipated the asserted claims of the patents-in-suit. (Gannon Decl. Exs. H, K, R, W). Those references were not included in its IPR petitions. (Gannon Decl. Ex. G). Google does not dispute that it was aware of the references at the time of filing its IPR petition.

Google further asserts that it intends to present other evidence at trial that it could not have submitted to PTAB as proof of invalidity. That evidence includes source code, oral presentations, expert testimony describing system features, non-public details regarding workstation parameters,⁸ non-public documents submitted in response to third-party subpoenas,⁹ and expert testimony based on observations at a conference.¹⁰ Google seeks to use some of that evidence in combination with printed publications, and states that the expert testimony may rely in part upon those publications.

For the reasons set forth above, Google is estopped from using patents and printed publications of which it was aware, or reasonably should have been aware, at the time of the IPR proceeding. That bar applies whether the patents and printed publications are offered as stand-

⁸ Google identifies the following evidence related to the VFLOAT system that it intends to introduce at trial:

The 2002-era VHDL source code for VFLOAT; public, oral presentations by Dr. Leaser and her graduate students regarding VFLOAT and its use on FPGA hardware, which show that the system was in public use, publicly known, and not abandoned, suppressed, or concealed; the percipient testimony of Dr. Leaser, based on her recollection and corroborated by both non-public and public documents, regarding the development, use, and public disclosures of and relating to VFLOAT; non-public details regarding the workstation Dr. Leaser and her team in the RCL used in connection with VFLOAT that are material to proving the system meets or satisfies certain claim limitations; and the written thesis of one of Dr. Leaser's graduate students, Pavle Belanovic, which corroborates certain aspects of Dr. Leaser's testimony.

(Def. SOF No. 10).

⁹ Google identifies the following evidence related to the CNAPS system that it intends to introduce at trial: non-public materials produced in response to a third-party subpoena to Dr. Dan Hammerstrom (designer of the CNAPS chips), and deposition testimony by Dr. Hammerstrom. (Def. SOF No. 7; Def. Opp'n at 10).

¹⁰ Google identifies the following evidence related to the GRAPE-3 system that it intends to introduce at trial:

The Okamura 1992 and 1993 articles describing the various elements of the GRAPE-3 system; the Makino 2003 and Makino 2005 articles that provide background regarding GRAPE systems in general, including GRAPE-3; the testimony of Google expert John Gustafson regarding his having seen a GRAPE-3 at the 1992 International Conference for High Performance Computing, Networking, Storage and Analysis (also known as "Supercomputing '92" or "SC1992") which was held in Minneapolis, Minnesota, USA, and regarding the number of execution units performing at least the operation of multiplication on 32-bit floating point formats that were present in the types of host computers used with the GRAPE-3.

(Def. SOF No. 4).

alone evidence, or in combination with other evidence that could not have been presented at the IPR proceeding. It may not offer that evidence directly (that is, it may not put those patents and publications in evidence). And it may not do indirectly what it cannot do directly—for example, it may not elicit expert testimony that regurgitates or summarizes the contents of those patents and publications. It may, however, generally present other forms of evidence of prior-art systems to support its invalidity claims. To the extent that there is disagreement as to whether particular testimony or other evidence falls within the estoppel bar, the Court will address the issue either through a motion *in limine* or at trial.

IV. Conclusion

For the foregoing reasons, the motion of plaintiff Singular Computing LLC for partial summary judgment of validity is DENIED. However, defendant Google LLC is estopped under 35 U.S.C. § 315(e)(2) from asserting at trial that U.S. Patent Nos. 8,407,273 and 9,218,156 are invalid on the ground that they were anticipated, or rendered obvious, in whole or in part, by any patent or printed publication of which Google LLC was actually aware, or reasonably could have become aware, as of the time of the *inter partes* review of those patents before the Patent Trial and Appeal Board.

So Ordered.

Dated: April 6, 2023

/s/ F. Dennis Saylor IV
F. Dennis Saylor IV
Chief Judge, United States District Court